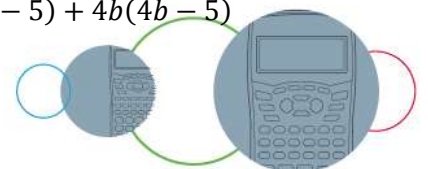


SHARP

Worksheet 16: Algebraic Expressions for Term 3

Grade 9 Mathematics

1. Given the expression: $5x^2 + 4xy - 3x^3 - 7$
- How many terms are in the expression?
 - What is the coefficient of x ?
 - What is the constant term?
 - What is the degree of the expression?
2. Simplify the following expressions:
- | | |
|---|---|
| a) $3x(4x - 5)$ | b) $9x^2\left(\frac{1}{3}x + 2x^3\right) - 4x\left(\frac{1}{2}x^4 - 3x^2\right)$ |
| c) $(3x^3)^2 + \sqrt{16x^{12}} - 8x^4$ | d) $(3x - 2)(9x^2 + 6x + 4)$ |
| e) $(y^2 + 3x)(7y - 2x)$ | f) $(8a + 7b)^2$ |
| g) $(4a^2 + 2b)(4a - 2ab + 9c)$ | h) $\frac{1}{2}abc\left(\frac{14a^2b}{c} + \frac{8ac^3}{b} - \frac{22c^3b^3}{a}\right)$ |
| i) $(15ab^2 + 3a^2bc^3 - 27abc) \div 3ab$ | j) $(5b^2c - 20b^3c^2 + 35b^5c) \div 5b^2c$ |
3. Given that $a = -1$; $b = 7$ and $c = 0$ find the value for each of the following expressions:
- | | |
|------------------------|---------------------|
| a) $17abc$ | b) $3a + 2b - 7c$ |
| c) $5a^3 + b^2$ | d) $-5a + 8b - 4ab$ |
| e) $10ab^2 - 15a + 3b$ | f) $(ab)^c$ |
4. Factorize each of these expressions by taking out the common factor:
- | | |
|------------------------------------|--------------------------------|
| a) $15ab + 25bc$ | b) $-18mn^2p - 36m^2n + 90mnp$ |
| c) $42x^2y^2z - 14xyz^2 + 77x^3yz$ | d) $3a(4b - 5) + 4b(4b - 5)$ |



e) $-9a + 3b - 6ab$

f) $36xy - 45x^2y + 63xy^2$

g) $8a(3b - c) + 7c(c - 3b)$

h) $12p^2q - 60pq^2 + 96p^2q^2$

i) $-70c^3b^2 + (7a^2c^3b)^2 - 35a^2b^2c^2$

j) $17a(b + 3c) - 34a^2(2b - 3c)$

5. Factorize each of these expressions by using the difference of squares method:

a) $9a^2 - 81b^2$

b) $64 - 81c^2$

c) $49c^2d^2 - 16$

d) $16a^8 - 1$

e) $27x^4 - 48x^2y^2$

f) $25x^8 - 121y^8$

g) $16x^2 + 25y^2$

h) $288x^8 - 64y^{16}$

i) $(3a + b)^2 - c^2$

j) $169a^2 - 100b^4$

6. Factorize the following trinomials:

a) $x^2 + 17x + 72$

b) $x^2 + 14x + 40$

c) $x^2 + 9x + 20$

d) $x^2 + 16x + 64$

e) $a^2 + 11a + 28$

f) $3b^2 + 42b + 135$

g) $y^2 + 6y + 5$

h) $z^2 + 14z + 49$

i) $7x^2 + 28x + 21$

j) $x^2 + 10x + 21$

k) $a^3 + 13a^2 + 40a$

l) $2b^2 + 20b + 18$

m) $11y^2 + 110y + 275$

n) $z^2 + 11z + 30$

o) $x^2 + 13x + 42$

p) $4x^2 + 52x + 48$

q) $a^2 + 14a + 48$

r) $9d^2 + 99d + 162$

s) $10m^3n + 140m^2n + 450mn$

t) $x^2 + 10x + 24$

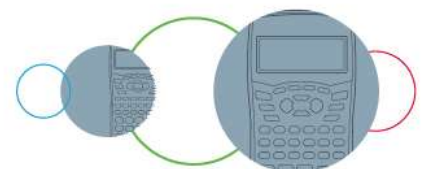
7. Factorize these expressions by using the methods in questions 4, 5 and 6.

a) $7abc - 56ac + 49bc^2$

b) $x^2 + 12x + 35$

c) $100x^4 - 81y^2$

d) $x^2 + \frac{5}{6}x + \frac{1}{6}$



e) $x^2 + 23x + 132$

f) $108x^2y^2 - 192a^2$

g) $81x^4 - 16y^4$

h) $4x^2 + 80x + 384$

i) $192a^2c^2 - 363b^2c^2$

j) $60m^3 + 12n^3 - 48mnp$

k) $42m^2n^2 - 84m^3n + 21m^4n^5$

l) $x^2 + 18x + 72$

m) $49c^4 - d^4$

n) $400 - 144x^4$

o) $36xyz + 19abc - 12bdf$

p) $5x^3 + 85x^2 + 350x$

q) $108x^3y + 75xy$

r) $3ax^2 + 66ax + 360a$

s) $x^2 + 24x + 144$

t) $x^2 + \frac{9}{20}x + \frac{1}{20}$

8. Simplify these algebraic fractions (do not multiply factors out again):

a) $\frac{x^2-16}{x^2+6x+8}$

b) $\frac{x^2+9x+14}{x^2+11x+28}$

c) $\frac{x^2-1}{x^2+9x+8} \times \frac{x^2+12x+32}{x^2-64}$

d) $\frac{a^2+8a+15}{3a^2+9a} \div \frac{a^2-25}{6a^2+42a}$

e) $\frac{x^2+3x+2}{8x+8} \times \frac{9x+27}{x^2-9}$

f) $\frac{3x+24}{x^2-16} \times \frac{x^2-36}{x^2+14x+48}$

g) $\frac{x^2+7x+12}{3ax+18a} \div \frac{x^2-9}{3ax^2+30ax+72a}$

h) $\frac{x^2+5x+4}{x^2-49} \times \frac{4x-28}{x^2+13x+36}$

i) $\frac{12-2x}{x^2+15x+56} \times \frac{x^2-49}{3x^2-18x}$

j) $\frac{x^2+5x+6}{x^2-64} \div \frac{9x-72}{x^2+11x+24}$

